

OPI Science Partner Task Force



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February 8–9, 2018
Billings, MT



Overview of Science Standards

- What standards (year) are the CRT-Science & CRT-Science Alternate Based on?
- What year did Montana adopt our new science standards that are aligned to the NGSS?
- When were/are districts expected to implement these new standards?
- How long is it recommended that students be exposed to new standards before large-scale testing for accountability?



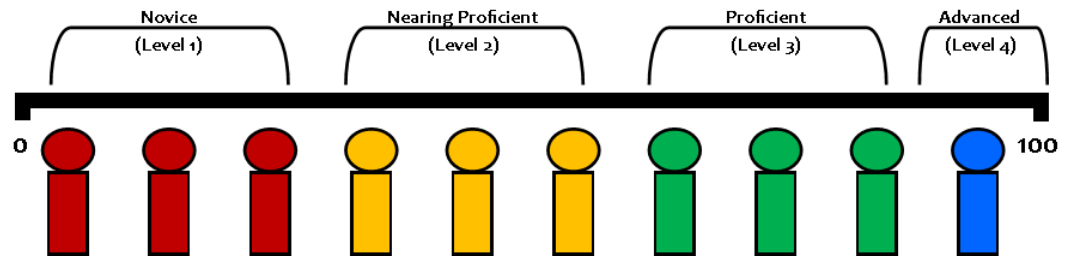
“2018 OPI Assessment and Data Conference”

www.kahoot.it

Federal Requirements

- Standard alignment
- Science administered annually not less than one time during:

- ELEM | Grades 3 to 5
- MS | Grades 6 to 9
- HS | Grades 10 to 12



- 95% Student Participation Overall/Subgroups
- Informative Reporting
 - Meaningful information about student performance
 - Minimum of 3 Performance Levels
 - Performance descriptions
 - Provide individual student reports to parents, teachers & principals
 - Include results on State and local report cards

State Requirements

- Assess at grades 4, 8, & 10 ([ARM 10.56.101](#))
- ARM 10.56.101(2) – “...primary purpose of assessment is to serve learning. ... includes formative, interim, & summative assessments aligned to state content standards to provide an integrated approach to meeting both classroom learning needs & school & state-level information needs. ... structured to continuously improve teaching & learning & to inform education policy.”
- Four levels of student performance standards ([ARM 10.55.606](#))
- Graduation requirements require a min. of:
 - 4 units of English language arts
 - 2 units of Mathematics
 - 2 units of Science ([ARM 10.55.905](#))



Balanced MT Assessment System

Formative

- **What?** A deliberate process used by teachers & students during instruction that provides actionable feedback used to adjust ongoing teaching & learning strategies.
- **Why?** Improve students' attainment of curricular learning targets/goals.
- **Purpose:** Help teachers adjust instruction to meet the learning needs and gaps of students.

Interim

- **What?** Benchmarking tool used strategically by schools, administrators, educators, parents, & students periodically throughout the school year to measure student grade/subject proficiency of the Montana Content Standards.
- **Why?** To predict future performance on summative assessments and to provide feedback to teachers to inform classroom instruction.
- **Purpose:** Help schools and teachers monitor student progress toward learning the standards.

Summative

- **What?** An evaluation tool used by states, districts/schools, administrators, educators, & parents to track progress toward education goals based on grade and content standards.
- **Why?** Describe student achievement, examine student improvement, address achievement gaps to help inform policy.
- **Purpose:** Help the state and schools monitor achievement over time in relation to the state goals.

**MT students graduating high school college-, career-, and
community-ready!**



Re-envision Assessments for Science

**Montana
Science
Performance
Standards
(NGSS-
aligned)**

for college &
career
readiness

Summative Assessments

Measure college & career readiness

**All students
leave high
school
college &
career ready**



**Teachers & schools have
information & tools they need to
improve teaching & learning.**

Interim Assessments

Flexible for actionable
feedback

Formative Assessment Process

Improve instruction & student
learning

State Requirements

[Access ESSA
Plan Here](#)



U.S. SECRETARY OF EDUCATION APPROVES MONTANA'S ESSA PLAN

Friday, January 19, 2018 / Categories: [Office of Public Instruction](#) / Tags: [ESSA](#), [Elsie Arntzen](#), [Dylan Klapmeier](#), [Montana Office of Public Instruction](#), [Montana Education](#), [Betsy DeVos](#)

See Table F for
details on
STEM indicator

FOR IMMEDIATE RELEASE

U.S. Secretary of Education Approves Montana's ESSA Plan

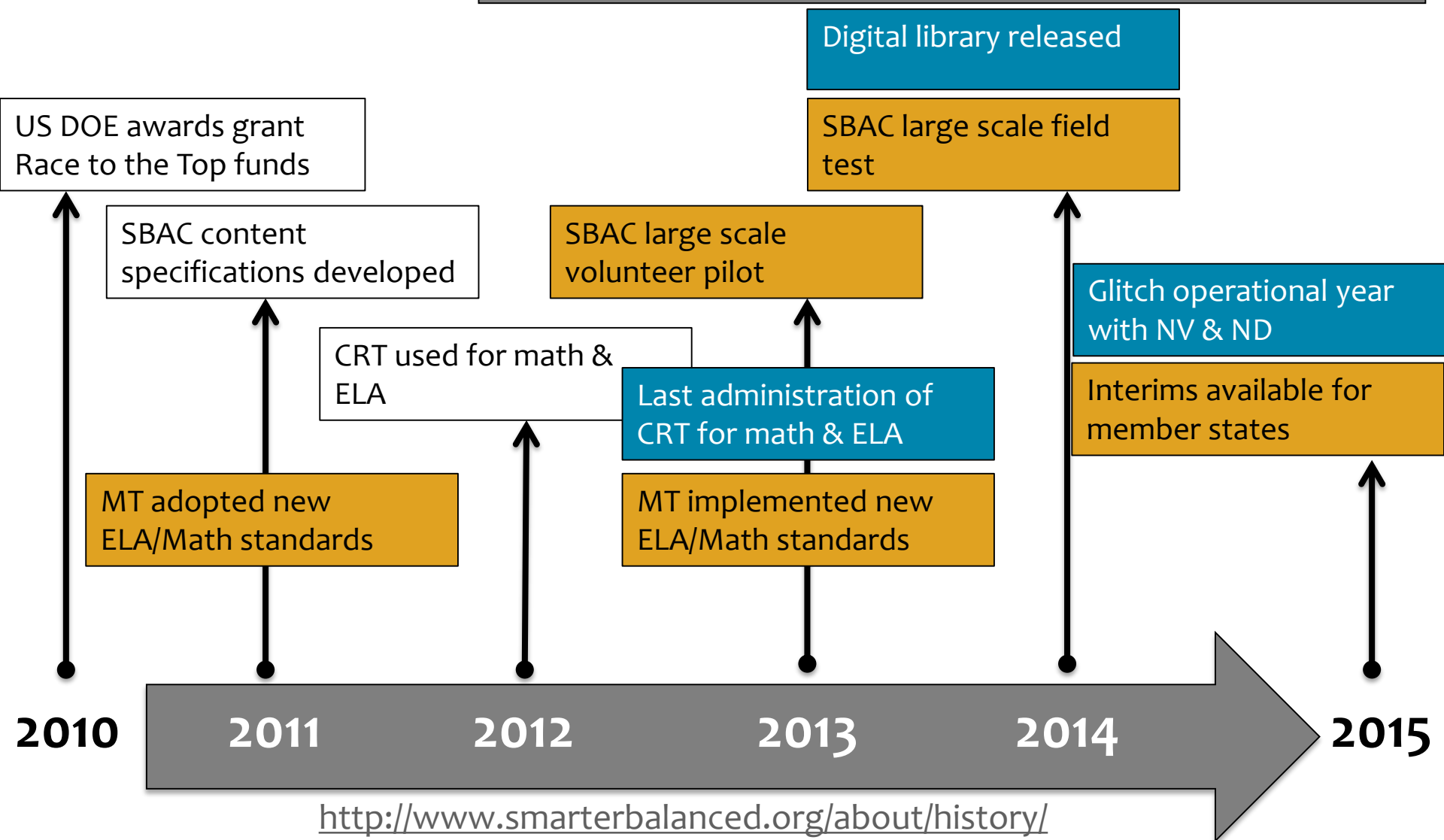
January 19, 2018

HELENA—U.S. Secretary of Education Betsy DeVos announced today that she has given her approval to Montana's state plan under the federal Every Student Succeeds Act (ESSA). Superintendent Arntzen spoke on the phone with Secretary DeVos this

Determinations for the 2018 accountability are based on the 2016-2017 CRT-Science data. The OPI will administer the CRT-Science and CRT-Science alternate in the spring of 2018.

Transition Plans: the OPI will continue to use the CRT-Science assessment in grades 4, 8, and 10* until the spring of 2020.

Smarter Balanced Phase-Out / Roll-Out Plan



Partnerships

Montana partner state in SCILLSS:

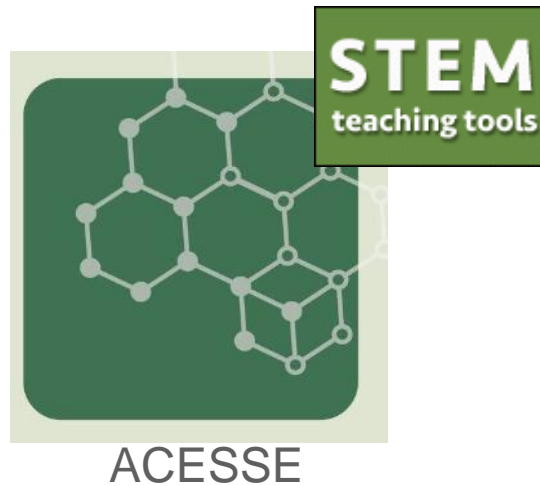
- Strengthening
- Claims-Based
- Interpretations & Uses of
- Local &
- Large-
- Scale
- Science Assessments

Educational Assistance Grant
funded by the US DOE

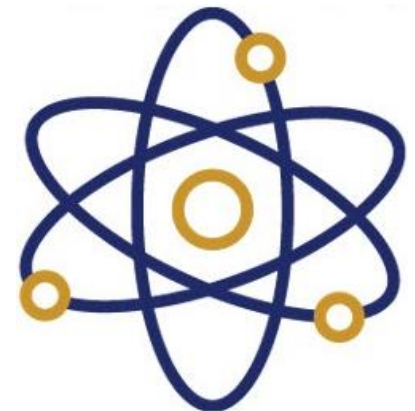


NSF ACESSE Project:

- Advancing
 - Coherent &
 - Equitable
 - Systems of
 - Science
 - Education
- (“access”) brings together
partners from educational
research & practice to improve
equity by building coherence in
science education



Science Partner Task Force



Establish the Task Force



Office of Public Instruction Science Partner Task Force

Putting Montana Students First



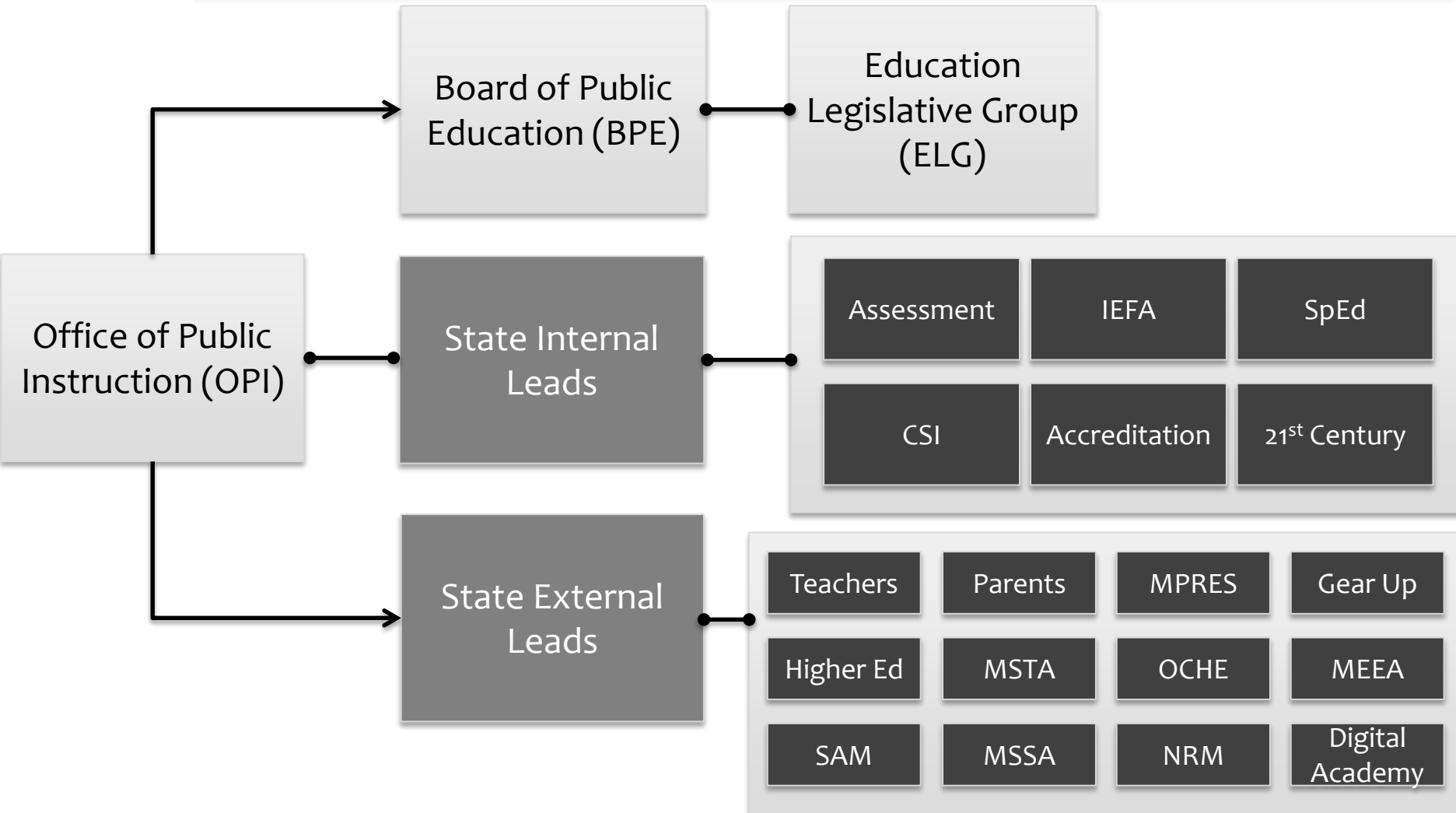
Montana is a geographically **large, rural state** with **distinct** and **unique regional** and **cultural differences**.

With its **vast perspectives** on science education and assessment, the OPI will **work with the field** to develop a common landscape and understanding of a coherent assessment system for science.

Task Force Expectations

- Membership and active participation
- Reliance on stakeholder perspective
- Consensus-driven decision-making
- Partnership with OPI to:
 - **build** capacity,
 - **grow** the support system,
 - **develop** actionable tools,
 - **Implement** relevant resources to support a re-envisioned system of science assessments.

Science Partner Taskforce



State Models

[Click Here](#)
[State Testing Plans](#)

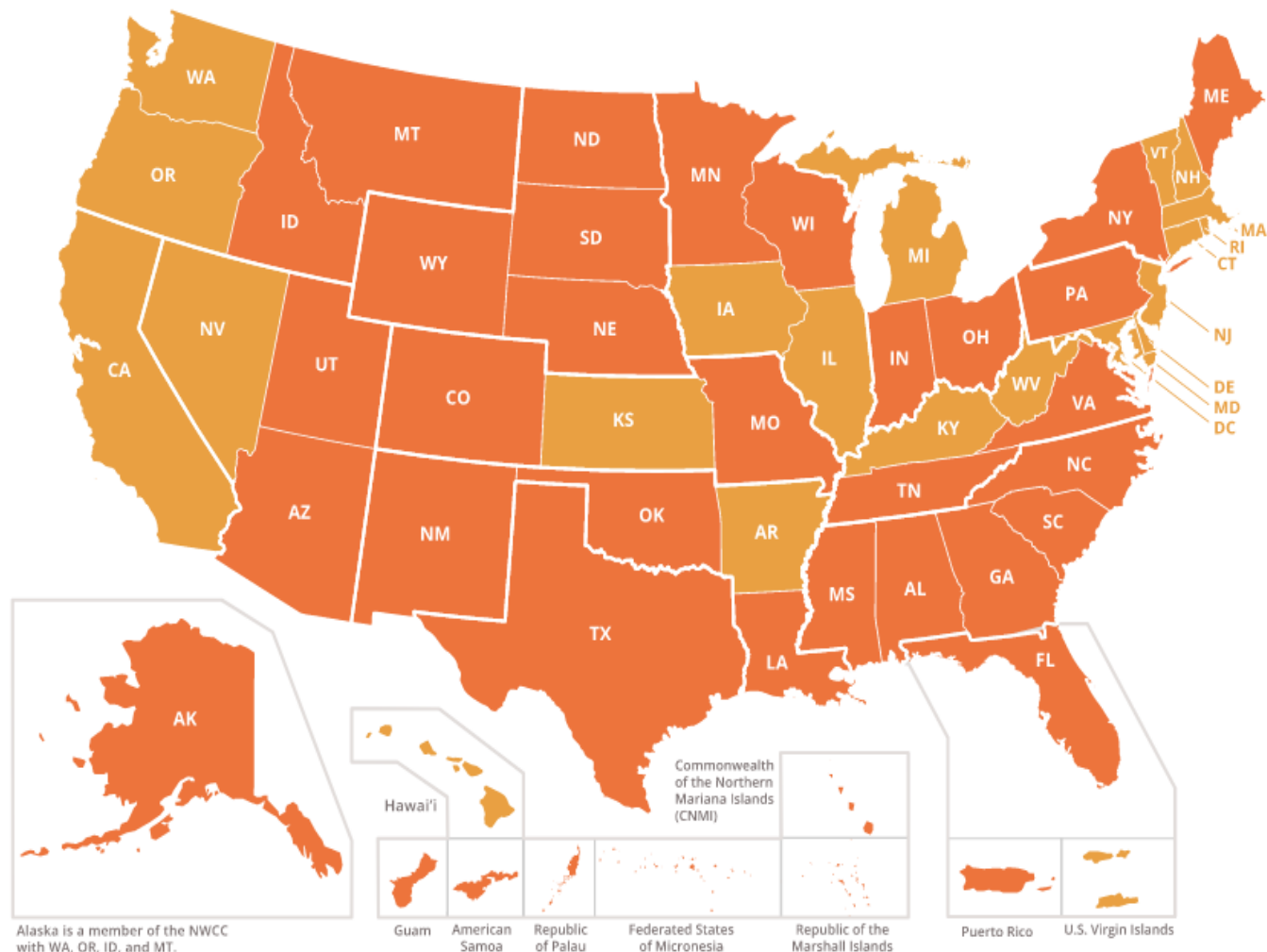
[Click Here](#)
[State Standards](#)



State-developed Standards



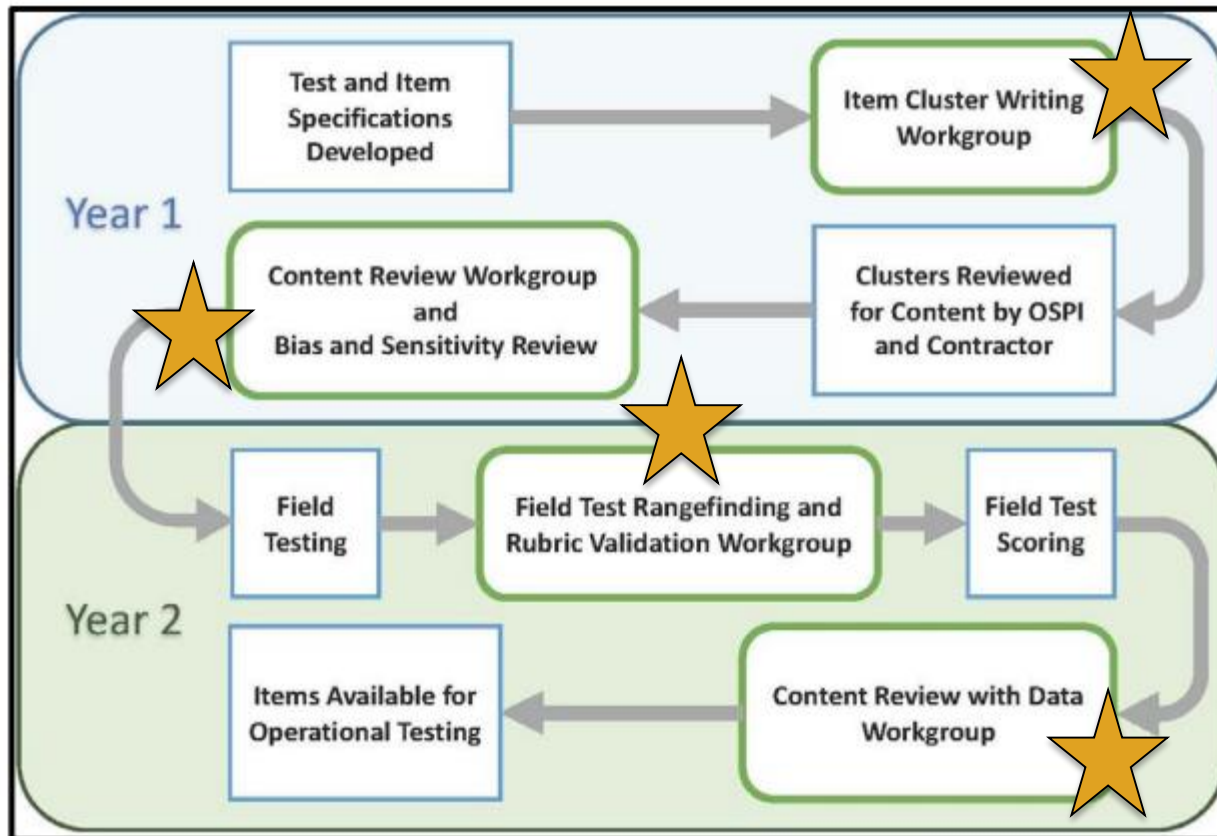
Next Generation Science Standards



WA Grades Assessed

Grade 5	Grade 8	Grade 11
3-5 Grade Band	MS Grade Band	9-12 Grade Band

Science Assessment Development Cycle



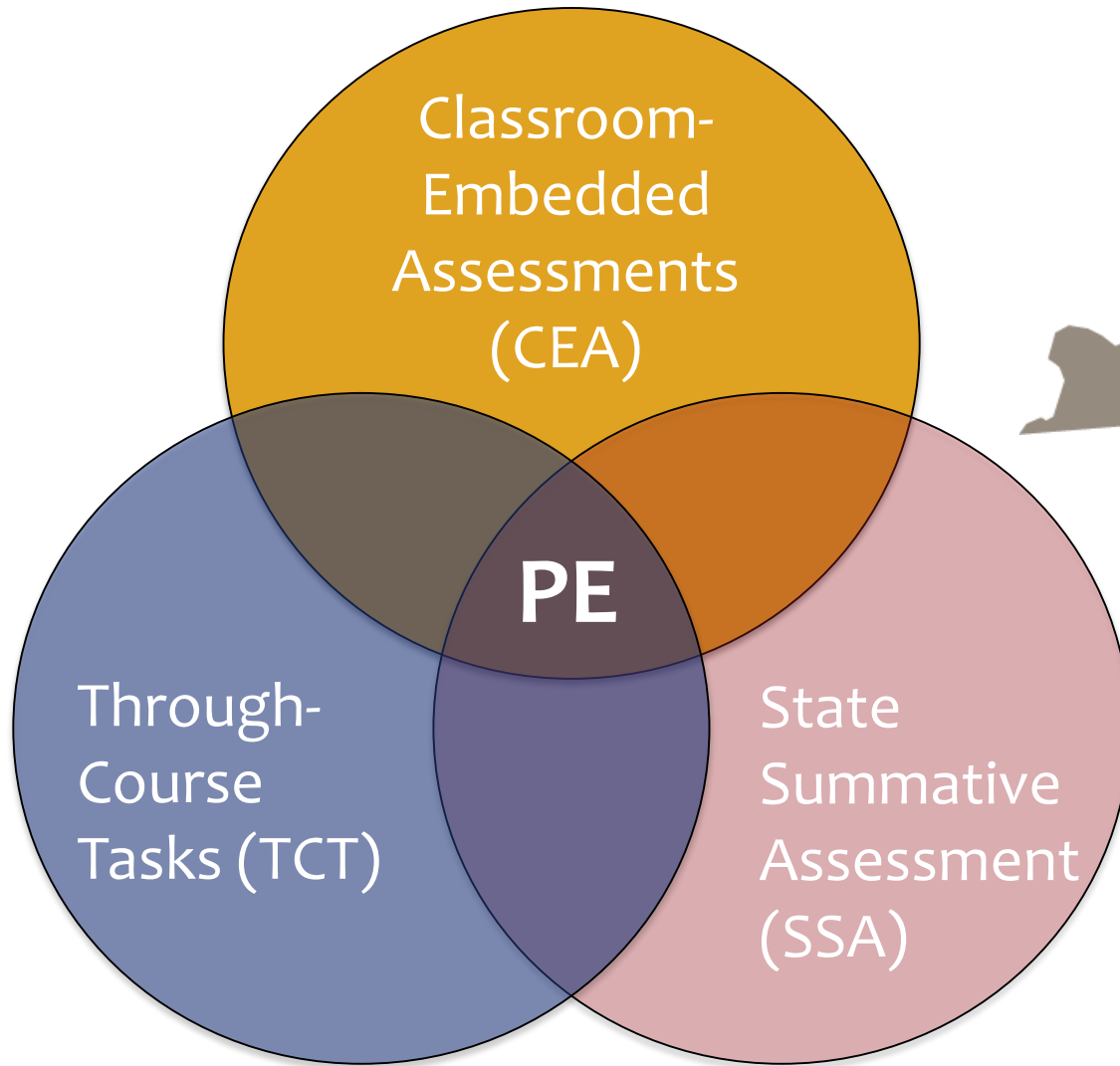


WA Educator Involvement

* Educators involved

Event	Timing			
Item Cluster Writing*	Oct 2015	Mar 2016	Oct 2016	May/Jun 2017
Content Review*	Dec 2015	Jul 2016	Dec 2016	Oct 2017
Bias/Sensitivity Review	Dec 2015	Sep 2016	Dec 2016	Oct 2017
Pilot/Field Testing	Spring 2017			Spring 2018
Pilot Range Finding*	Summer 2017			Summer 2018
Content Review with Data*	Fall 2017			Summer 2018
Test Planning Meeting*	November 2016			
ALD Development*	November 2017			
Alignment Study*	Early 2018			
Contrasting Groups Study*	Early Spring 2018			
AL Setting*	Summer 2018			

KY Educator Empowerment



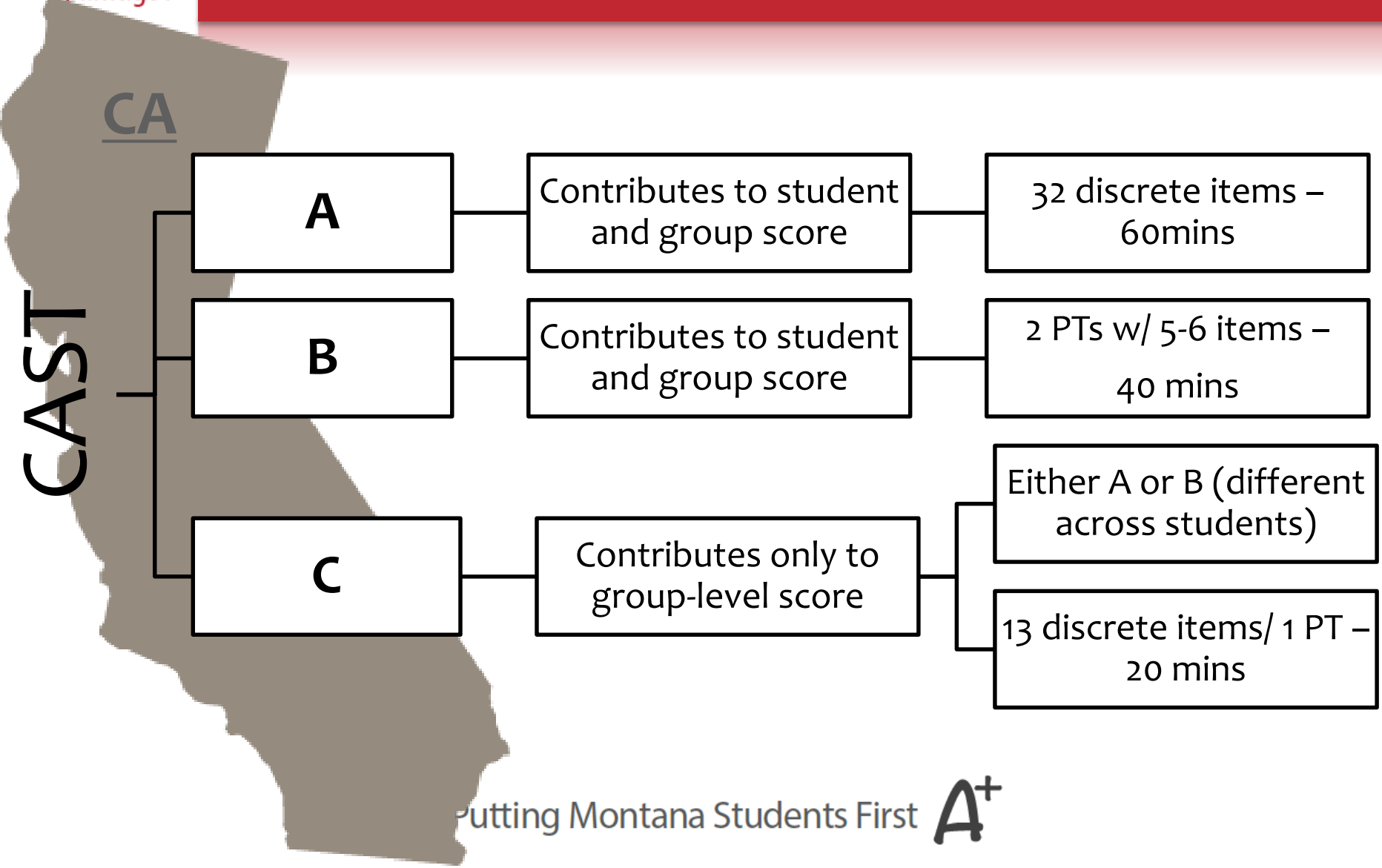
CT Federal Flexibility

- **US DOE Flexibility?**

- October 19th - Connecticut received a waiver for science
- Census Field Test 2017-2018
- SBAC Model: Double-Testing Waiver



CA Matrix Sampling



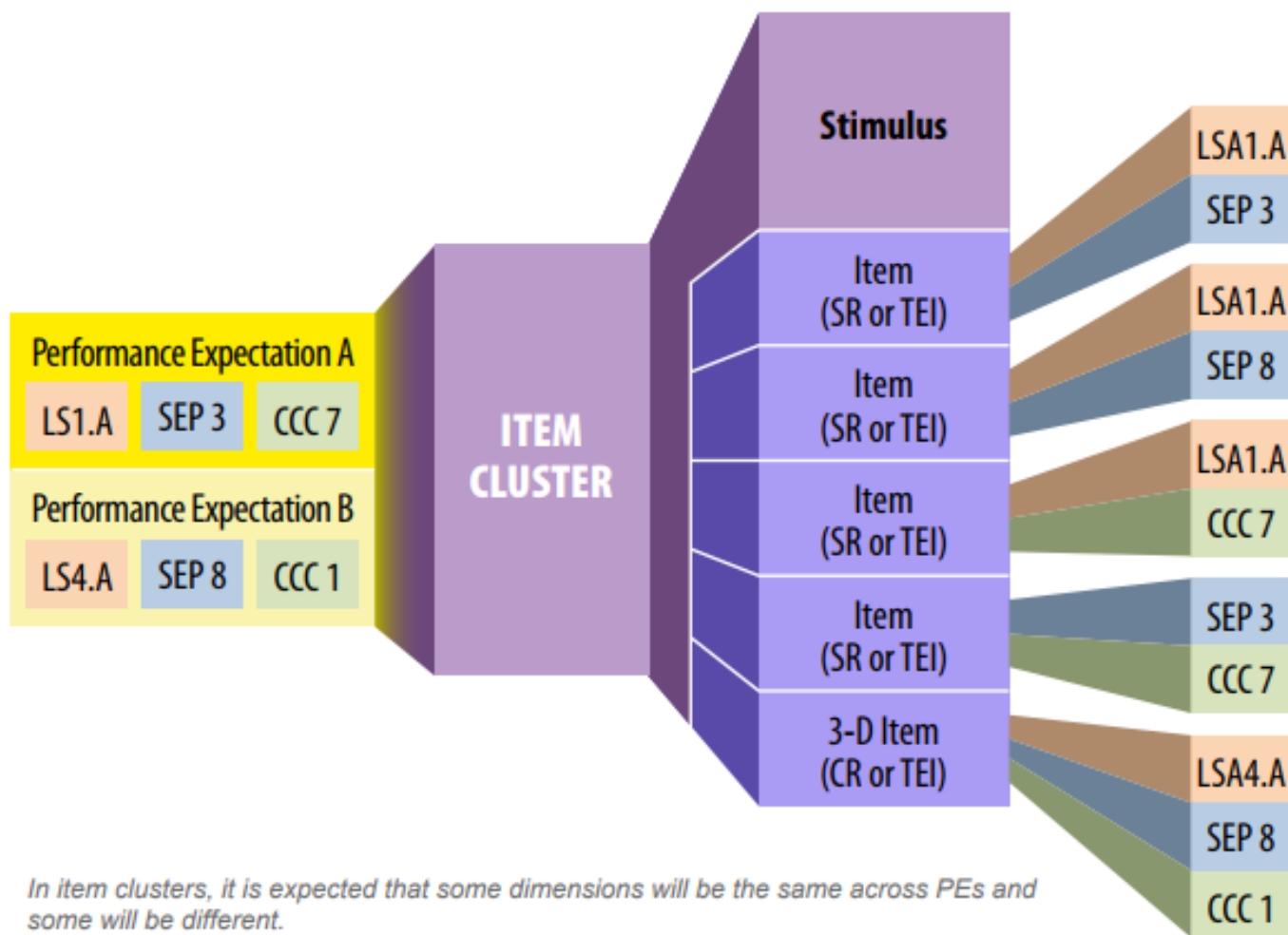
OK Item Clustering

- **Item Cluster** - set of items (usually 4-6 items) with at least 1 common stimulus (e.g., text, audio, video, simulation, etc.).



Content Assessment	Total Items	Total Operational Items and Points	Total Field Test Items
Grades 5, 8 & 10 (2017)	54 Items (18 clusters)	45 items (15 clusters)	9 items (3 clusters)
Grade 11 Integrated Assessment (2018)	60 items (20 clusters)	54 items (18 clusters)	6 items (2 clusters)

Item Cluster Example



MI Test Transition



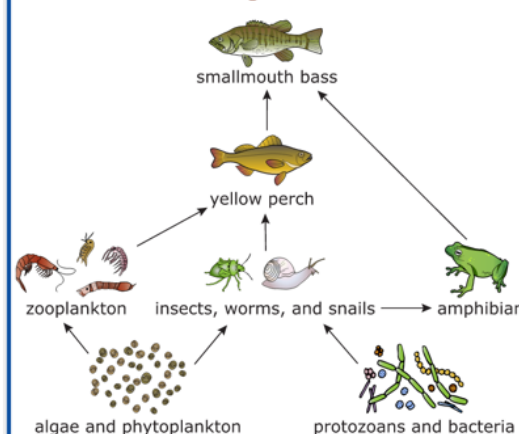
- Hybrid Test? No.
- Check alignment of old items to new standards.
- Could MT take paper items and transfer them online?

Grade 4 Science
Question 5

Training Student

Use the food web to answer the question.

Lake Michigan Food Web



```

graph TD
    A[algae and phytoplankton] --> B[zooplankton]
    A --> C[insects, worms, and snails]
    B --> D[yellow perch]
    C --> D
    C --> E[amphibian]
    D --> F[smallmouth bass]
    E --> F
  
```

Spring floods prevented yellow perch from laying eggs. These floods will likely cause the yellow perch population to , which will also cause the .

Review/End Test Pause Flag Back Next

GLCE Standard: L.EC.04.21 Explain how environmental changes can produce a change in the food web

MSS Performance Expectation: 3-LS4-4 Make a claim about the merit of a solution to a problem caused when the environment changes and the types of plants and animals that live there may change



MI Implementation Timeline

- **Spring 2017**
 - **MSTEP:** continues testing with items aligned to 2006-adopted Science Standards (Grade 4, 7 & 11)
 - **Separate Pilot Test** New MSS aligned item clusters in select schools (Grades 5, 8 & 11)
- **MDE hoping for flexibility through its ESSA plan to do the following:**
 - **Spring 2018** – **Pilot** MSS aligned item clusters (grades 5, 8, & 11)
 - Accountability TBD
 - **Spring 2019** – Aligned MSS M-STEP statewide **Field Test** (Grades 5, 8, & 11)
 - Accountability TBD
 - **Spring 2020** – **Fully operational** MSS assessment (Grades 5, 8, & 11)

Existing Vendor Models

What are some existing vendor models to choose from?

- Measured Progress
- American Institutes for Research (AIR)
- WestEd
- Many more...

AIR Item Example

<https://demo.tds.airast.org/ngss/>

Items: **Unit 1: Wolves**


Back Next Pause Item Score

In Yellowstone National Park, a group of wolves chases after a bison.

Unlike many animals that hunt smaller animals for food, wolves hunt larger animals like elk and bison.

Figure 1 compares the ordinary heights, in feet (ft), and the weights, in pounds (lbs) of a wolf, an elk, and a bison.

Figure 1. Ordinary Heights (ft.) and Weights (lbs.) of Wolf, Elk and Bison



Wolf
2.6 ft.
106 lbs.

Elk
4.7 ft.
600 lbs.

Bison
5.8 ft.
1500 lbs.

An elk and a bison are both stronger than a wolf, while a bison is stronger than an elk.

While some wolves live and hunt by themselves, most do so in groups called "packs." Wolves do not catch food every time they hunt. Table 1 shows how many elk and bison are caught by one wolf, a small wolf pack, and a large wolf pack out of 100 times each tried to hunt.

Table 1. Number of Animals Caught by Wolves (out of 100 Tries)

Size of Wolf Pack	Elk Caught	Bison Caught
One wolf	15	0
Small pack (3-5 wolves)	35	5
Large pack (10-12 wolves)	35	30

Your Task

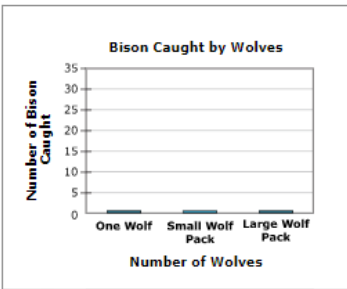
1

Part A

Using the information provided in Table 2, create a bar graph showing the number of bison caught by different numbers of wolves.

- Select a point where the top of each bar should be.

Bison Caught by Wolves



Part B

Which statement is supported by the Bison Caught by Wolves graph in part A?

- Ⓐ Large packs of wolves catch fewer bison than small packs of wolves.
- Ⓑ Small packs of wolves can catch as many bison as large packs of wolves.
- Ⓒ Small packs of wolves can catch the same number of animals as one wolf.
- Ⓓ Large packs of wolves can catch more bison than one wolf or a small pack of wolves.

Part C

Using the information provided about each animal in the text and Table 1, select the **two** statements that explain why wolf packs prefer to catch elk over bison.

- ☐ Elk are smaller than bison.
- ☐ Elk are less common than bison.
- ☐ Elk are not as strong as bison.
- ☐ Elk have antlers and bison do not.

WestEd

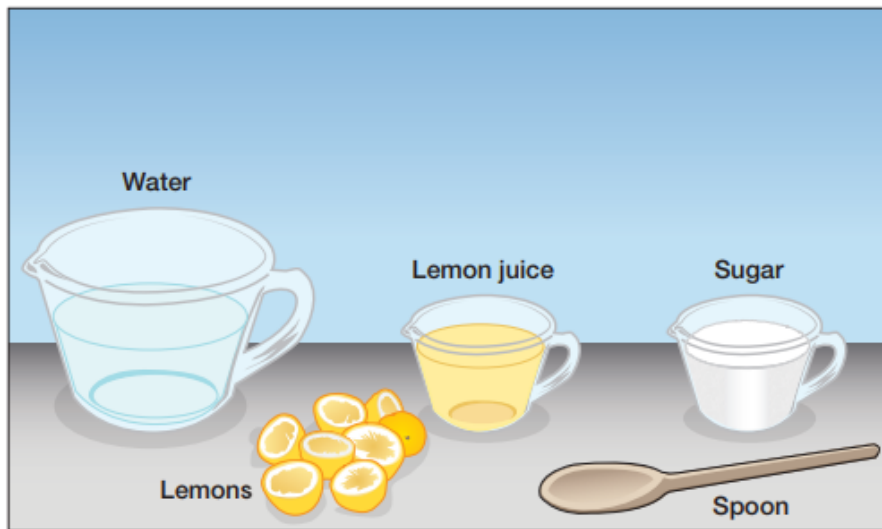
- Delaware and other states are working with WestEd to develop 3-D assessment systems
- Science Assessment Item Collaborative
- **What does this look and feel like?**



WestEd / SAIC Item Example

<https://docs.learnosity.com/demos/clients/wested/index.php>

Students are making lemonade using three ingredients: water, lemon juice, and sugar. While making the lemonade, the students plan to investigate how the ingredients are affected by a physical change that happens when the ingredients are stirred together. The students measure out how much of each ingredient they need by following a recipe.



REPLAY

Click REPLAY to watch the animation/video again.

Click NEXT to continue

NEXT

Stimulus

Media (animation/video): Stimulus is introduced; zoom in to each ingredient as it is presented to the student. It is recommended that the video include an audio narration.

Platform prompt and student control

Parallel Planning Efforts

- MT Theory of Action
- Transition Plan
- Rule and Statute Impacts
- Competitive Bid Process



Theory of Action (ToA) Overview

Statewide Assessment Design System (SADS)

Montana is a local-control state and as such the OPI will work with the BPE and partners to implement changes that are reasonable and responsive to the unique educational circumstances of Montana's K–12 accredited schools.

System Setting and Use (SSU)

Montana's state and local science assessments measure the MCS (2016) for science knowledge, skills, and abilities essential for community, college, and workforce readiness.

Teacher Actions (TA)

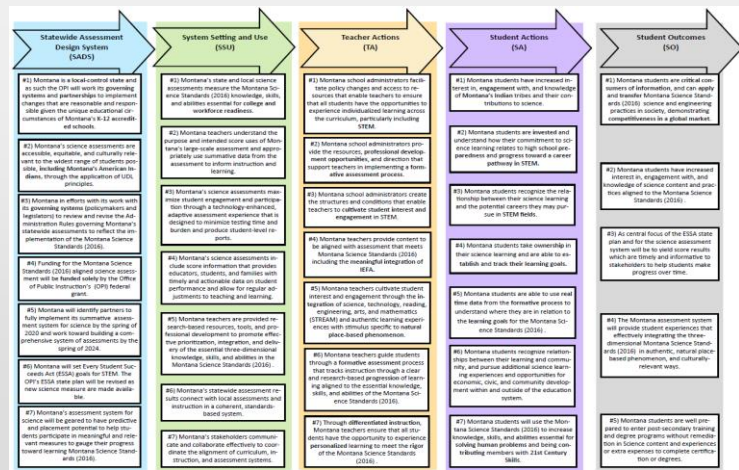
Montana school administrators facilitate policy changes and access to resources to support teachers and students with opportunities to experience individualized learning across the curriculum including STEM and having access to technology.

Student Actions (SA)

Montana school administrators facilitate policy changes and access to resources to support teachers and students with opportunities to experience individualized learning across the curriculum including STEM and having access to technology.

Student Outcomes (SO)

Montana students are critical consumers of information and can apply and transfer MCS (2016) for science learning to complex and novel situations thus demonstrating globally competitive skillsets necessary for postsecondary success.



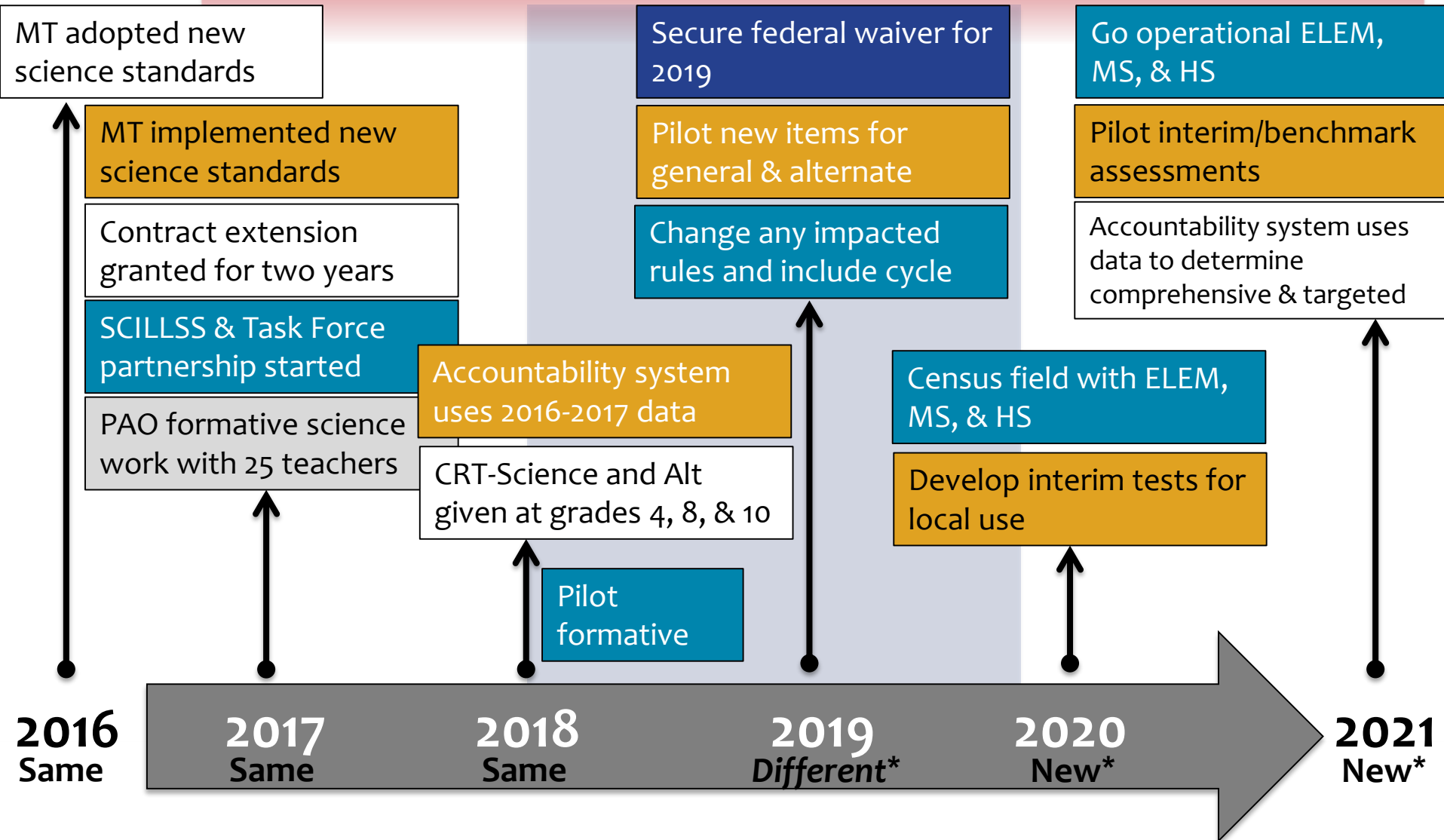
Click to access
[ToA](#)

Parallel Planning for Science





Science Phase-Out / Roll-Out Idea



Science Assessment Expectation?

- What is your level of agreement to moving the grades we assess (e.g. Grades 5, 8 & 11)?
- How important is the role of educators in the development of the test?
- Should MT consider pursuing federal flexibility for the upcoming years to transition?
- Are student score reports/interpretations the only thing that matters?
- Should MT build a balanced system of assessments for science (formative, interim & summative)?
- If you aren't already, do you want to be on the OPI Science Partner Task Force?



Questions?

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